

2/1/15

10/534719  
JC06 Rec'd PCT/PTO 12 MAY 2005

1

### Description

The invention concerns a method for labelling as well as a method for identifying a package, particularly one filled with cigarettes, which includes a packing element for holding the product to be packed as well as a wrapping at least partially surrounding the packing element. Furthermore the invention is concerned with a device for labelling as well as a device for identifying a package, particularly one filled with cigarettes, which includes a packing element for holding the product to be packed as well as a wrapping at least partially surrounding the packing element. Furthermore the invention concerns a package, in particular a cigarette packet.

Packaging in the sense according to the invention can be soft packages, hard packages (so-called hinged-lid packages), storage tins or other containers for cigarettes, cigars, loose tobacco or the like. The packing element itself can consist of several components. In order to label and identify packages and in particular cigarette packets, namely in order to be able to check the packaging for authenticity or origin, various methods and devices are known. Usually the packages are given e.g. a bar code during manufacture. By means of a scanner or the like, the bar code is then read for checking, so that the information contained in the bar code allows a conclusion about the manufacturer, the place of manufacture, etc.

However, other, even more elaborate possible ways of labelling and identification are known too, in which magnetic strips or the like are applied as information carriers in the region of the package, wherein the magnetic strips can contain information e.g. on the manufacturer, place of manufacture, date, etc.

However, the known methods and devices for labelling and identifying packaging as well as the corresponding packages themselves have the drawback that they do not allow unambiguous and unequivocal labelling or identification of the package. Namely, it is possible to put in circulation forged packages whose original source cannot be proved, as the known methods and devices can be manipulated by bypassing, imitating or forging

labels, e.g. the bar codes. Also considerable expenditure is necessary for labelling, which leads in particular to elevated costs in manufacture of the packages.

It is therefore the object of the present invention to propose an easy-to-handle device as well as a cheap method for labelling and an easy-to-handle device as well as a cheap method for identifying a package, particularly one filled with cigarettes, which ensure an unambiguous and reliable authenticity check of the package. Furthermore, it is the object of the invention to propose a package which can be labelled and identified easily and reliably.

This object is achieved by a method for labelling a package, particularly one filled with cigarettes, which is characterised by the following steps:

- during the process of manufacturing the package, at least one individual code which is allocated once only is applied to the packing element and/or the wrapping and stored in a storage medium,
- during the process of manufacturing the package, furthermore at least one property characteristic of the packing element and/or the wrapping is detected as a measurable variable,
- the measurable variable is assigned to the code associated with the packing element in the storage medium to form a unique data record.

With such a labelling method, namely labelling the packaging with a fixed and therefore invariable but individual code, on the one hand, and a manufacture-related measurable variable of the packing element and/or wrapping itself which is variable and random for all successive packages, on the other hand, a package can be clearly marked by assigning the code and the measurable variable to a unique data record for each package, so that it can be ensured that the package was unequivocally manufactured by the authorised manufacturers themselves. Labelling is also very easy and therefore cheap, because apart

from an ordinary code no extra elements have to be applied to the packaging. On the contrary, the invention makes use of the peculiarities of each package itself for labelling.

In a development of the invention, in addition a scanning mark is applied to the packing element and/or wrapping, facilitating detection of the characteristic property of each package as a measurable variable. Moreover, this scanning mark can also be print which is to be applied to the package anyway or is already present, e.g. the brand name, a logo or the like.

Advantageously, the position and overlap width of the joint seam of the wrapping relative to the scanning mark is determined as a measurable variable. Due to this procedure, even greater reliability is achieved when detecting the measurable variable.

In another preferred embodiment, deviations of the position of folds and/or cut edges and/or overlap regions of the wrapping as well as the position and embossing of patterns which form due to joining or closing of the wrapping particularly by welding in the region of joints or seams as a measurable variable, are determined. With this simple labelling which arises automatically in manufacture of the package without extra expenditure, there is provided an individual, unpredictable measurable variable which can be determined reliably and so used for labelling.

Furthermore, the object is achieved by a method for identifying a package, particularly one filled with cigarettes, which is characterised by the following steps:

- detection of at least one individual code which is applied to the packing element and/or the wrapping and allocated once only,
- detection of at least one property characteristic of the packing element and/or the wrapping as a measurable variable,

- comparison of the detected code and measurable variable with a unique data record for each package which is stored in a storage medium during manufacture of the package and composed of code and measurable variable.

With such an identification method, the authenticity of the package - and hence manipulation or forgery of the package - can be detected easily and reliably, as the characteristic property of the packing element and/or wrapping is present in all manufactured packages in an unpredictable and inimitable manner, so that opening the wrapping already leads to a measurable change in the property used for labelling. On comparison of the code and measurable variable picked up for checking, with the pack-specific unique data record filed previously in a data bank or the like, it can easily be determined whether there is a match or not. Here the measurable variable can be detected, and by scanning the data bank the associated code can be determined. The latter is then compared with the code on the package which has just been checked. There is also the possibility of detecting the code and, by scanning the data bank, determining the associated measurable variable which is then compared with the measurable variable to be detected on the package which has just been checked. In case of matching, the authenticity of the product can be assumed with a high degree of certainty.

Preferably, the position and overlap width of the joint seam of the wrapping relative to a scanning mark applied to the packing element and/or wrapping is determined as a measurable variable. Due to the auxiliary measure, the reliability of detection of the measurable variable is further increased, so that the error quota when checking for authenticity of the package can be further lowered.

Advantageously, deviations of the position of folds and/or cut edges and/or overlap regions of the wrapping as well as patterns of the joints or seams formed particularly by welding are determined as a measurable variable. These pack-specific measurable variables allow particularly reliable and easy identification of the package, particularly also on account of the fact that opening the wrapping e.g. for the purpose of manipulation inevitably leads to altered measurable variables.

The object is moreover achieved with a generic device for labelling a package, particularly one filled with cigarettes, by the fact that the device includes means for detecting at least one property characteristic of the packing element and/or the wrapping as a measurable variable as well as a storage medium for storing the detected measurable variable, wherein the means and the storage medium are connected to each other via a personal computer (PC) or the like for assigning the measurable variable to an individual code for the package which is allocated once only and filed in the storage medium. With such a device, in particular the method according to the invention can be carried out. By simple means the device allows labelling of each package which allows unambiguous proof of authenticity at any time. As standard elements which are usually present anyway on the apparatuses for manufacture of the packages can be used for the device, the device is cheap and also easy to handle.

Furthermore, the object of the invention is also achieved by a generic device for identifying a package, particularly one filled with cigarettes, by the fact that the device includes means for detecting at least one property characteristic of the packing element and/or the wrapping as a measurable variable as well as a storage medium for storing the detected measurable variable, wherein the means and the storage medium are connected to each other via a personal computer (PC) or the like for comparing an individual code which is allocated once only and the detected measurable variable of the package to be identified, with a unique data record for each package stored in the storage medium beforehand and composed of code and measurable variable. For this device too, commercially available standard elements can be used as means for detecting the code and measurable variable. Moreover, such a device can also be used as a transportable unit, which further increases the possibilities of use.

Finally, the object is also achieved by a packaging of the generic kind by the fact that an individual code readable from the outside and allocated once only is applied to the packing element and/or wrapping, and in addition a scanning mark or the like is provided for detection of a characteristic property of the packing element and/or wrapping as a

measurable variable. With such a package, detection of a property characteristic of the packing element and/or wrapping is assisted, which further increases the reliability of authenticity checking.

Further preferred developments or embodiments of the methods and devices as well as of the package are to be found in the subsidiary claims and the description. The principle of the devices and methods for labelling and identification as well as a preferred package are described in more detail with the aid of the drawings. The drawings show:

- Fig. 1            a cigarette packet with a code and an additional scanning mark,
- Fig. 2            an enlargement of detail A in Figure 1,
- Fig. 3            schematic extracts of data storage in table form in a data bank, and
- Fig. 4            a top view of the end face of a package with scanning marks formed by the wrapping itself in the form of distances, angles and patterns.

The methods and devices are used for manufacturing, and so in particular for labelling and for identifying packages, in order to be able to check the authenticity of the packages.

Basically, each cigarette package 10 consists of a packing element 11 and a wrapping 12. The wrapping 12 usually consists of a transparent cellophane wrapping. Other materials can be used as well. Inside the packing element 11, which in certain circumstances is also in several parts, is arranged the product to be packed. The wrapping 12 surrounds the packing element 11 preferably completely and usually has to be opened by means of a tear-off strip 13. In the manufacture of such packages 10, which is known and for which a detailed description is dispensed with at this point, each package is provided with a code 14. This code 14 is preferably designed as a progressive number, so that each code 14 is allocated only once. Every single package 10 therefore has an individual code 14. The code 14 can also consist of letters, combinations of letters and numbers or other

individual characters. The fact that each code 14 is allocated once only is crucial. The code 14 is stored preferably by the manufacturers themselves directly when awarded or applied to the package. An ordinary data bank is suitable for this, for example. The code 14, which can be printed, stamped or otherwise applied to the packing element 11 and/or wrapping 12, can also be detected only after application by additional means and delivered to the storage medium, namely the data bank. The code 14 can, additionally or alternatively to individual labelling of each package 10, also contain information on the package 10 itself, e.g. data, time, place, machine, etc., and is arranged on the package 10 so as to be readable from the outside.

Furthermore, during the process of manufacture of the package 10, preferably at the end of the manufacturing process, a property characteristic of the packing element 11 and/or the wrapping 12 is detected as a measurable variable. This variable and unpredictable measurable variable is assigned to the code 14 belonging to the packing element 11 and/or wrapping 12, in the storage medium, to form a unique data record. This data record can be supplemented as desired with further information, e.g. date (see Figure 3). The individual apparatus components which are necessary for manufacture of the package are also linked to the data bank, so that the desired information can be stored or read out directly.

The position and overlap width of the joint seam 15 of the wrapping 12 is determined as a particularly suitable measurable variable. Characters, logos, writing or the like which are already on the package 10, or even physical characteristics, e.g. edges of the packing element 11, can be used as reference measuring points. Alternatively or additionally, other characteristic measurable variables can be detected too, e.g. the gap width between lid and container of a hard box, the offset of mutually overlapping parts of the packing element 11 or the wave pattern of the joint seam.

Particularly preferred measurable variables are shown in Figure 4. The packing element 11 is surrounded by the wrapping 12 in the original state of the package 10. Usually, in the region of the end faces of the package 10 the wrapping 12 has fold dimensions. The

fold dimensions are individual for each package 10. Changes or deviations in the position of folds, cut edges, overlap regions, e.g. indicated by the distances  $d$  and  $e$  as well as the angles  $\alpha$  and  $\beta$ , here serve as a pack-specific measurable variable. Alternatively or in combination with the above-mentioned measurable variables, patterns 17 and 18 arising due to joining or closing the wrapping for example by welding can also be determined as a measurable variable. The patterns 17, so-called wave patterns, usually form due to warping, tinting or the like. The patterns 18 in the region of contact surfaces of the wrapping 12 are formed e.g. by air bubbles. The position of the patterns 17 and 18, marked by way of example in Figures 1 and 4, is not limited to the points shown. On the contrary, the patterns 17 and 18 can be formed at any other point of the package 10. The deviations in the exact position or in the patterns are however not confined to the distances, angles and patterns shown in Figure 4. Any pack-specific variable as distance, angle, pattern, dimensional ratio or the like which is detectable from the outside can be used as a measurable variable.

In the event that the wrapping 12 has a tear-off strip 13, the geometry and/or the position of the tear-off strip 13 can likewise be detected as a characteristic property.

In order to assist detection of the measurable variable or form precise reference points, in addition a scanning mark 16 is appropriately applied to the packing element 11. The scanning mark 16 is rigidly connected to the packing element 11 and arranged so as to be readable or detectable from the outside. Alternatively, the scanning mark 16 can also be attached to the wrapping 12 or even form part of the package 10 itself or print on the package 10. The wrapping 12 itself can serve as the scanning mark 16 or form the latter. The scanning mark 16 is arranged in the region of the joint seam 15 or directly below the joint seam 15 in the embodiment shown in Figure 1, wherein the scanning mark 16 projects a certain amount  $b$  or  $c$  beyond the joint seam 15 on both sides. On detection of the measurable variable, the projecting amounts  $b$  and  $c$  as well as the width of the overlap  $a$  are determined and compiled to form the characteristic measurable variable or characteristic number. Since exact measurement results are important in this measurement, the scanning mark 16 is preferably rigidly connected to the wrapping 12, e.g. by



gluing, by sealing or the like, to prevent relative displacement of the scanning mark 16 and wrapping 12 to each other. Even in case of displacement of the scanning mark 16 relative to the joint seam 15 or vice versa, however, unambiguous allocation can be made or authenticity proven, as the width of the overlap  $a$  is not altered by the displacement and even the sum of the projecting amounts  $b$  and  $c$  remains the same. The scanning mark 16 can also be arranged e.g. on the end face of the package 10, so that the distances  $d$  and  $e$  and/or the angles  $\alpha$  and  $\beta$  too can be determined with reference to the scanning mark 16.

The code 14 as well as the measurable variable of each package 10 are preferably detected optically and processed electronically. However, all other contactless and/or mechanical detection, measuring and processing methods can be employed too. Preferably, the region of the joint seam 15 with the scanning mark 16 underneath it can be photographed and surveyed with a suitable camera or the like. The measurable variable  $abc$  can then be determined from the measured values.

To check a package 10 for authenticity, again the characteristic property, that is, in the embodiment shown in Figure 1 the measurable variable  $abc$ , in the embodiment of Figure 4 the position of the folds and/or cut edges and/or overlap regions by the distances  $d$  and  $e$  as well as the angles  $\alpha$  and  $\beta$  or the patterns 17, 18 is measured or detected. By inquiry, e.g. by telephoning, direct network connection or the like, to the data bank which is usually accessible only to the manufacturer, it is verified whether the measurable variable ( $abc$  or  $d$ ,  $e$ ,  $\alpha$  and  $\beta$  or patterns) and the code 14 to be found on the package 10 belong together. If a data record which completely matches the data record of the tested package 10 is located in the data bank, the authenticity of the package 10 can be assumed with a high degree of certainty. It can also be inquired what measurable variable belongs to a code 14 which is detected by the tester or determined automatically. Also, both the code 14 and the measurable variable can be detected and started as a data record inquiry. The inquiry can therefore be made easily, i.e. without any linking, e.g. by a tester. In case of automated inquiry, the individual components, means, memories and the like of the device are linked to each other.

The devices with which the packages 10 are labelled and/or identified consist of commercially available components, so that a detailed description is dispensed with. It is important that there is a means for detecting at least one property characteristic of the package 10, for labelling the packages 10. This means can be an optical or mechanical device, e.g. a camera. In addition, a storage medium is appropriate for storing on the one hand the previously applied code and on the other hand also the measurable variable which is determined. A data bank which can be controlled via a PC or the like is possible as the storage medium. The individual means as well as the data bank and the PC are linked together in order also to be able to ensure allocation of the code and measurable variable. Due to linking, identification can even be performed fully automatically. To apply the code 14, the device can also include a separate means which is an integral part of the device itself.

The device for identification of the package is constructed similarly to the device just described, and can even be identical with the latter. In addition, however, the device appropriately also has means for detecting the code. The means for detecting the measurable variable and the code can also be constructed as a unit or even be identical.